

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

KONINKLIJKE PHILIPS N.V.,

Plaintiff

v.

QUECTEL WIRELESS SOLUTIONS CO.
LTD.,

Defendants.

Civil Action No.:

JURY TRIAL DEMANDED

COMPLAINT AND JURY DEMAND

1. Plaintiff Koninklijke Philips N.V. (“Philips”) is a public limited company established under the laws of the Netherlands, having its registered office at High Tech Campus 52, 5656 AG Eindhoven, The Netherlands.¹

2. Defendant Quectel Wireless Solutions Co. Ltd. (“Quectel”) is a Chinese entity headquartered at Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China.

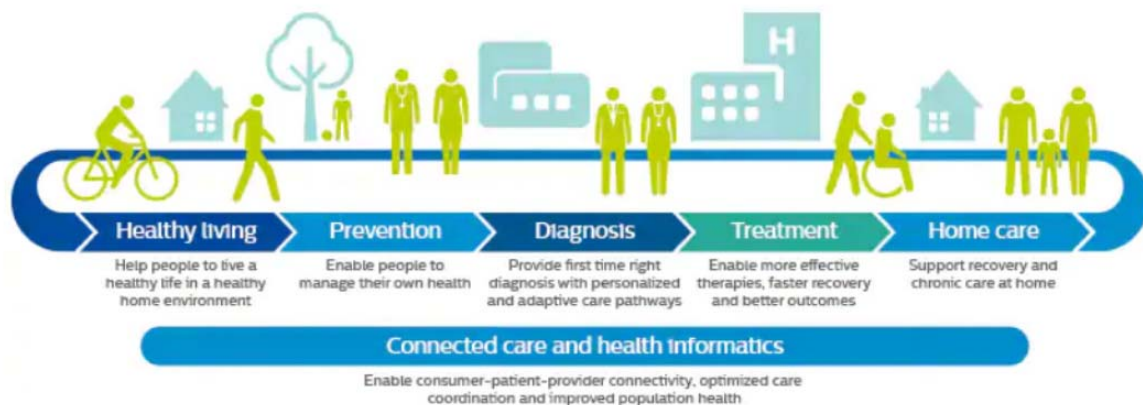
3. Quectel – individually and/or jointly with others – has infringed (literally and/or by equivalents), and continues to infringe, Philips’ patent rights by making, using, importing, selling, and/or offering to sell products and methods covered by one or more patent claims within the United States, and/or by contributing to or inducing such infringement.

4. Quectel induces its subsidiaries, affiliates, retail partners, and direct and indirect customers into making, using, selling, offering for sale, and/or importing throughout the United States, including within this District, products and methods accused of infringement. Quectel

¹ Allegations herein are with knowledge with respect to Philips’ own acts and on information and belief as to other matters.

provides a distribution channel of infringing products within this Judicial District and the U.S. nationally.

5. Since its founding in 1891, Philips has dedicated significant resources to research and development for the advancement of health monitoring technology used around the world through its business units including those described below. Philips strives to make the world healthier and more sustainable through innovation with the goal of improving the lives of billions of people. Philips approaches healthcare as a continuum where its technologies can be applied across activities of healthy living, prevention, diagnosis, treatment and home care as depicted in this graphic:



6. Connected health technologies developed by Philips are employed across the health continuum. With uses inside and outside hospitals, Philips has developed technologies that empower consumers to better manage their health by improving access to and analysis of personal health and fitness information obtained in various manners.

7. Philips researches and develops health monitoring technology, develops and sells products that allow individuals to monitor and improve their health, and transfers or licenses its technologies and/or the patents that protect its technologies to customers who use the technologies in their products. As a result of these efforts, Philips has become a world leader in health

monitoring technology and innovation and a major contributor to the United States economy and jobs.

8. Philips is also a world-recognized innovator of digital cellular communication technology facilitating the interconnection of devices through communication networks and with the internet or world-wide web. Philips is a founding member of the European Telecommunications Standards Institute (“ETSI”) and participates in the 3rd Generation Partnership Project (“3GPP”). ETSI, 3GPP and member Philips have been instrumental to bringing efficient and functional cellular data communications to people across the world increasing the standard of living for millions of people.

9. Philips has engaged in research and development in the mobile communications area since the 1980s, including work on 3G cellular communications and Universal Mobile Telecommunications Service (“UMTS”) starting in the 1990s and work on 4G cellular communications and Long-Term Evolution (“LTE”) starting in the 2000s. Philips has been actively involved in research throughout the development of UMTS and also during the core development phase of LTE, including from the initial phase, going through finalizing the first release of LTE, and then continuing for further years of additional work. Philips has also actively engaged in the standardization process, with representatives of Philips attending standardization meetings and making technical contributions to the development of the world-wide standards.

10. Philips also manufactured 2G (Global System for Mobile (“GSM”)) phones, particularly in the early 2000s, in addition to its mobile communications research, and also had a significant portfolio of patents related to GSM. While Philips stopped manufacturing mobile telecommunications by around 2006, Philips continued with mobile communications research, including research related to UMTS and LTE, through around mid 2010.

11. Philips shares its innovation with others through, for example, its pioneering role in offering access to its technology through licensing. In this way, Philips has been able to share its innovations with many other companies. Philips' patent portfolio currently includes more than 60,000 patents. In 2019, for example, Philips filed for over 1,000 new patents, with a focus on health technology services and solutions.

12. In accordance with ETSI licensing practices, Philips has proceeded in good faith to offer its world-wide cellular communications portfolio for licensing including to Quectel, as explained herein. Revenue received from the licensing of Philips' innovations through such global licenses is used to fund further research within Philips, including in the healthcare field.

13. Occasionally, a company like Quectel will not accept Philips' offers to license its technology, putting Philips in the difficult position of enforcing its patents on a patent by patent basis in each country around the world. Quectel leverages the enormous expense of such litigation to hold-out on and refuse to accept the world-wide license offered by Philips. As the Supreme Court of the United Kingdom recently observed in relation to ETSI technology, "implementers who were infringing the patents would have an incentive to continue infringing until, patent by patent, and country by country, they were compelled to pay royalties." See *Unwired Planet Int'l Ltd v. Conversant Wireless Licensing SARL*, [2020] UKSC 37 at ¶167 (Aug. 26, 2020).

Companies like Quectel maintain a fund to pay damages in the event that they are ever required to pay royalties by a court such as this one (the United States District Court for the District of Delaware), either directly or through indemnification of their customers. Quectel has no intention of ever agreeing to the world-wide license that Philips offers for its global portfolio consistent with ETSI practices.

14. The devices claimed in the Asserted Patents have proved to be of great importance to the field of digital cellular communications including 3G UMTS and/or 4G LTE cellular standards established by ETSI and 3GPP. These patents, and others, are fundamental technology to the manufacture and sale of cellular communication modules and related internet of things (“IoT”) devices.

JURISDICTION AND VENUE

15. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§1331 and 1338(a).

16. This Court has both general and specific personal jurisdiction over Quectel. Quectel has purposefully availed itself of the privilege of conducting business activities and has conducted and done business in the State of Delaware. Quectel has availed itself of the rights and benefits of Delaware law and has engaged in systematic and continuous contact with the State of Delaware including with respect to the development, manufacture, marketing, sale, and use of one or more Accused Products. Quectel also derives substantial revenue from sales of the infringing products and services in the State of Delaware, and it has availed itself of the privilege of doing business with Delaware. Quectel is doing business and has committed acts of infringement in this Judicial District.

17. This Court further has personal jurisdiction over Quectel pursuant to 10 Del. C. § 3104 and Fed. R. Civ. P. 4(k)(2). Quectel places infringing products into the stream of commerce knowing they will be sold and used in the State of Delaware and elsewhere in the United States and economically benefits from the retail sale of infringing products in the State of Delaware. Quectel alone or through other subsidiaries as agents, makes the Accused Products and supplies

and/or makes available the Accused Products to companies that further market and sell the Accused Products. Together, the division of labor between making, manufacturing, marketing and sales amongst the Quectel and its distributors amounts to an organized association, establishing a distribution channel for the Accused Products in the United States. Quectel knows or can reasonably foresee that a termination point of the distribution channel targeted to the United States includes this Judicial District.

18. Venue is proper under 28 U.S.C. §§ 1391(c)(3), and 1400(b) because Quectel is a foreign corporation. As noted above, Quectel has committed and continues to commit acts of infringement under Fed. R. Civ. P. 4(k)(2) and within this Judicial District giving rise to this action.

THE ASSERTED PATENTS

19. This action involves the following patents: U.S. Patent Nos. 9,178,577 (“the ’577 patent”), 9,635,599 (“the ’599 patent”), 7,089,028 (“the ’028 patent”), 8,195,216 (“the ’216 patent”), 8,134,929 (“the ’929 patent”) and 10,257,814 (the ’814 patent”) (collectively, “the Asserted Patents”).

QUECTEL’S KNOWLEDGE OF THE ASSERTED PATENTS

20. For years, Philips has repeatedly offered to license rights to its world-wide portfolio that includes the Asserted Patents (and others) to Quectel, but Quectel has refused to accept Philips’s offers to license.

21. For example, at least as early as December 29, 2015, Quectel has had actual knowledge of the ’577 patent, the ’028 patent, the ’929 patent, the ’216 patent, and the applications leading to the ’599 patent and the ’814 patent. As a result of such knowledge of the underlying applications, Quectel had actual knowledge of the ’599 and ’814 patents upon their issuance.

Having been put on notice of infringement of such pending and issued rights at that time, Quectel has been aware of its infringement for more than half a decade or has been willfully blind to such infringement.

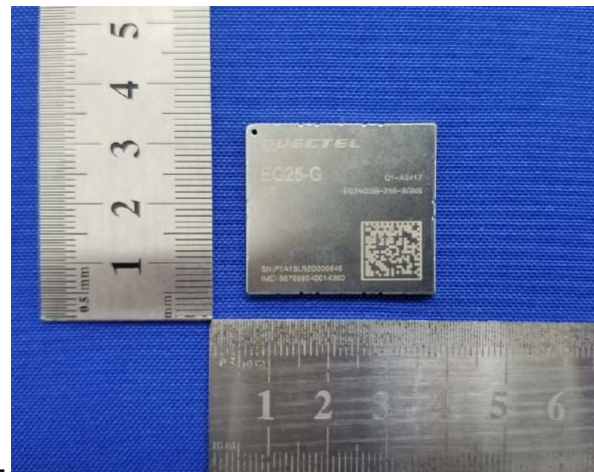
22. Quectel has followed a path of willful and wonton infringement leveraging Philips attempts to license in a manner to prolong its use of the technology without paying, all along collecting vast sums of money in revenues through infringement in a manner consistent with an “efficient infringement” tactical approach.

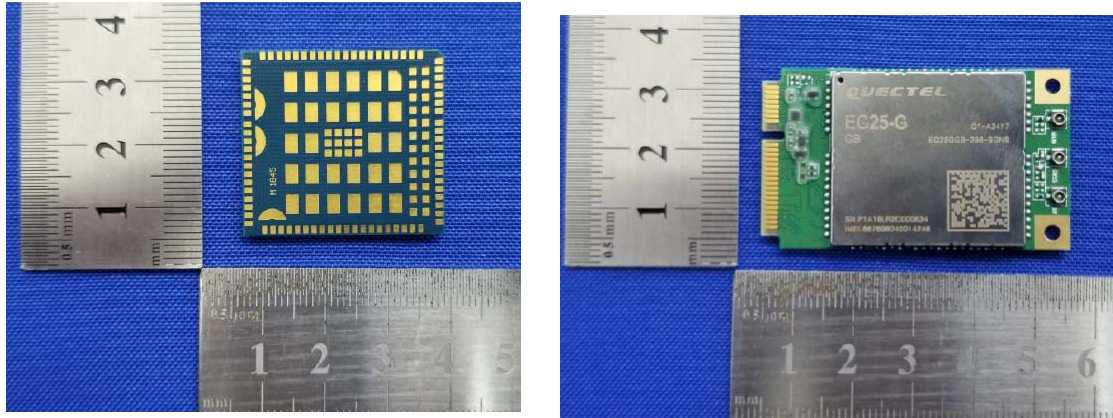
The Accused Products

23. Quectel is, and has been, engaged in manufacturing and/or having manufactured, selling and/or offering for sale within the United States, using in the United States, and/or importing into the United States cellular communication modules providing functionality covered by one or more claims of the Asserted Patents.

24. Non-limiting examples of the infringing products manufactured, sold, offered for sale, used, and/or imported by or for Quectel include the EG25-G and the like, as set forth, for example, in Quectel’s catalog. *See* <https://www.quectel.com/product/>.

25. Below are photos of the EG25-G, as provided to the United States Federal Communications Commission (“FCC”), paving the way towards sales, marketing, use and implementation in the United States and on the U.S. cellular network:





26. Quectel has sought and obtained certification of its modules (including Quectel's EG25-G and the like) from a number of carriers, including AT&T and Verizon among others, for use of Quectel's modules (including Quectel's EG25-G and the like) on the U.S. cellular network including LTE and HSPA+ wireless networks.

The '577 Patent

27. Philips is the owner of all rights, title and interest – including the right to bring a suit for patent infringement – in the '577 patent, entitled “Radio Communication System with Plural Paths From a Primary Station with Plural Antennas to a Secondary Station ” (copy attached as Exhibit A, hereto). The '577 patent stems from a patent application filed on April 23, 2002.

28. Among other things, the '577 patent provides:

In a radio communication system, radio signals typically travel from a transmitter to a receiver via a plurality of paths, each involving reflections from one or more scatterers. Received signals from the paths may interfere constructively or destructively at the receiver (resulting in position-dependent fading). Further, differing lengths of the paths, and hence the time taken for a signal to travel from the transmitter to the receiver, may cause inter-symbol interference.

(Ex. A at 1:14-21.)

29. The '577 patent further provides:

A problem with the use of a MIMO system for packet data transmission is the impact of differing radio link qualities on the communication system. For example, some of the data streams may have very poor quality radio links, and if all the data is combined this will degrade the performance of the other links.

(*Id.* at 2:6-11.)

30. The '577 patent thus notes that one “object of the present invention is to provide a MIMO system having improved performance.” (*Id.* at 2:13-14.) The '577 patent notes that there are a plurality of paths between a primary station and a secondary station, with the primary station transmitting a plurality of data packets to the secondary station, with “each packet being transmitted via a different subset of the plurality of paths, and the secondary station receiv[ing] the plurality of data packets, determin[ing] whether each packet is received correctly and signal[ing] this determination to the primary station for each of the plurality of packets.” (*Id.* at 2:15-27.)

31. Various technological solutions to the difficult problems are set forth in the '577 patent and its claims, including claim 18. The claims of the '577 patent were not well known, routine or conventional at the time of the inventions and when viewed as a whole, including as an ordered combination, address difficult technical challenges in the field of radio communications. A person of ordinary skill in the art would have recognized this fact and would have recognized that the claims represent specific improvements over the prior art and prior existing systems and methods in the field of radio communications. A person of ordinary skill in the art would have further understood that the claims of the '577 patent, including claim 18, are not directed to an abstract idea, nor are they directed to a disembodied concept or pre-existing fundamental truth, but instead are directed to real-world applications in the field of radio communications, including, for example, physical devices such as a primary station and secondary station, with antennas and transceivers, which are used in ways that are concrete systems that improved radio communications.

32. Furthermore, a person of ordinary skill in the art would have understood that the claims of the '577 patent, including claim 18, did not pre-empt any field, but instead are improvements in the technology of radio communications.

33. At the time of the inventions claimed in the '577 patent, a person of ordinary skill in the art would have recognized that there were, for example, no radio communications systems that transmitted multiple data packets in parallel by different subsets of the available paths, in the manner specified in some of the various claims of the '577 patent, which in prior systems could cause some data streams to have poor quality data links and could degrade the performance of other links. A person of ordinary skill in the art would have recognized that the claims of the '577 patent are directed to such specific improvements in the field of radio communications and that the claims are not directed to the implementation of pre-existing practices.

34. A person of ordinary skill in the art would understand that the claims of the '577 patent are rooted in computer technology – i.e., radio communications – and comprise technological improvements of prior technologies in order to provide new functionality and overcome inefficiencies, including those noted above. The claimed solutions amount to an inventive concept for the particular problems noted above, as a person of ordinary skill in the art would have understood.

35. Consistent with 35 U.S.C. § 282 and the limitations of the claims of the '577 patent, a person of ordinary skill in the art also would have understood that each claim of the '577 patent (independent or dependent) relates to a separate invention distinct from other claims.

The '599 Patent

36. Philips is the owner of all rights, title and interest – including the right to bring a suit for patent infringement – in the '599 patent, entitled “System, Method, and Devices for Multi-

Path Communication” (copy attached as Exhibit B, hereto). The ’599 patent stems from a continuation application of a parent patent application filed on April 23, 2002 (which is now the ’577 patent).

37. Among other things, the ’599 patent provides:

In a radio communication system, radio signals typically travel from a transmitter to a receiver via a plurality of paths, each involving reflections from one or more scatterers. Received signals from the paths may interfere constructively or destructively at the receiver (resulting in position-dependent fading). Further, differing lengths of the paths, and hence the time taken for a signal to travel from the transmitter to the receiver, may cause inter-symbol interference.

(Ex. B at 1:26-33.)

38. The ’599 patent further provides:

A problem with the use of a MIMO system for packet data transmission is the impact of differing radio link qualities on the communication system. For example, some of the data streams may have very poor quality radio links, and if all the data is combined this will degrade the performance of the other links.

(*Id.* at 2:19-24.)

39. The ’599 patent thus notes that one “object of the present invention is to provide a MIMO system having improved performance.” (*Id.* at 2:28-29.) The ’599 patent notes that there are a plurality of paths between a primary station and a secondary station, with the primary station transmitting a plurality of data packets to the secondary station, with “each packet being transmitted via a different subset of the plurality of paths, and the secondary station receiv[ing] the plurality of data packets, determin[ing] whether each packet is received correctly and signal[ing] this determination to the primary station for each of the plurality of packets.” (*Id.* at 2:30-42.)

40. Various technological solutions to the difficult problems are set forth in the ’599 patent and its claims, including claim 20. The claims of the ’599 patent were not well known, routine or conventional at the time of the inventions and when viewed as a whole, including as an ordered combination, address difficult technical challenges in the field of radio communications.

A person of ordinary skill in the art would have recognized this fact and would have recognized that the claims represent specific improvements over the prior art and prior existing systems and methods. A person of ordinary skill in the art would have further understood that the claims of the '599 patent, including claim 20, are not directed to an abstract idea, nor are they directed to a disembodied concept or pre-existing fundamental truth, but instead are directed to real-world applications in the field of radio communications, including, for example, physical devices such as a primary station and secondary station, with antennas and transceivers, which are used in ways that are concrete systems that improved radio communications.

41. Furthermore, a person of ordinary skill in the art would have understood that the claims of the '599 patent, including claim 20, did not pre-empt any field, but instead are improvements in the technology of radio communications.

42. At the time of the inventions claimed in the '599 patent, a person of ordinary skill in the art would have recognized that there were, for example, no radio communications systems that transmitted multiple data packets in parallel by different subsets of the available paths, in the manner specified in some of the various claims of the '599 patent, which in prior systems could cause some data streams to have poor quality data links and could degrade the performance of other links. A person of ordinary skill in the art would have recognized that the claims of the '599 patent are directed to such specific improvements in the field of radio communications and that the claims are not directed to the implementation of pre-existing practices.

43. A person of ordinary skill in the art would understand that the claims of the '599 patent are rooted in computer technology – i.e., radio communications – and comprise technological improvements of prior technologies in order to provide new functionality and overcome inefficiencies, including those noted above. The claimed solutions amount to an

inventive concept for the particular problems noted above, as a person of ordinary skill in the art would understand.

44. Consistent with 35 U.S.C. § 282 and the limitations of the claims of the '599 patent, a person of ordinary skill in the art would have understood that each claim of the '599 patent (independent or dependent) relates to a separate invention distinct from other claims.

The '028 Patent

45. Philips is the owner of all rights, title and interest – including the right to bring a suit for patent infringement – in the '028 patent, entitled “Radio Communication System” (copy attached as Exhibit C, hereto). The '028 patent stems from a patent application filed on January 6, 2000.

46. Among other things, the '028 patent provides:

There are two basic types of communication required between a Base Station (BS) and a Mobile Station (MS) in a radio communication system. The first is user traffic, for example speech or packet data. The second is control information, required to set and monitor various parameters of the transmission channel to enable the BS and MS to exchange the required user traffic.

(Ex. C at 1:11-17.)

47. The '028 patent further provides:

In many communication systems one of the functions of the control information is to enable power control. Power control of signals transmitted to the BS from a MS is required so that the BS receives signals from different MS at approximately the same power level, while minimising the transmission power required by each MS. Power control of signals transmitted by the BS to a MS is required so that the MS receives signals from the BS with a low error rate while minimising transmission power, to reduce interference with other cells and radio systems. In a two-way radio communication system power control is normally operated in a closed loop manner, whereby the MS determines the required changes in the power of transmissions from the BS and signals these changes to the BS, and vice versa.

(*Id.* at 1:18-31.)

48. The '028 patent further notes that “[a]n example of a combined time and frequency division multiple access system employing power control is the Global System for Mobile communication (GSM), where the transmission power of both BS and MS transmitters is controlled in steps of 2 dB.” (*Id.* at 1:32-36.) The '028 patent further notes that Code Division Multiple Access (“CDMA”) used power control techniques. (*Id.* at 1:36-39.)

49. The '028 patent states:

A problem with these known techniques is that at the start of a transmission, or after the transmission is interrupted, the power control loops may take some time to converge satisfactorily. Until such convergence is achieved data transmissions are likely to be received in a corrupted state if their power level is too low, or to generate extra interference if their power level is too high.

(*Id.* at 1:40-46.)

50. The '028 patent states that “[a]n object of the present invention is to address [that] problem.” (*Id.* at 1:47-48.) The '028 patent further provides that an aspect of the inventions includes having a communication channel between a primary station and a secondary station, with the communication channel comprising an uplink and a downlink control channel for the transmission of control information, and a data channel for the transmission of data, where “power control means are provided for adjusting the power of the control and data channels and means are provided for delaying the initial transmission of the data channel until after the initial transmission of the control channels.” (*Id.* at 1:49-60.)

51. The claims of the '028 patent, including claim 12, when viewed as a whole, including as an ordered combination, address difficult technical challenges in the field of radio communications. The claims of the '028 patent were not well known, routine or conventional at the time of the invention. A person of ordinary skill in the art would have recognized this fact and would have recognized that the claims represent specific improvements over the prior art and prior existing systems and methods. A person of ordinary skill in the art would have further understood

that the claims of the '028 patent, including claim 12, are not directed to an abstract idea, nor are they directed to a disembodied concept or pre-existing fundamental truth, but instead are directed to real-world applications in the field of radio communications, including, for example, physical devices such as a primary station and secondary station, which are used in ways that are concrete systems that improved radio communications.

52. Furthermore, a person of ordinary skill in the art would have understood that the claims of the '028 patent, including claim 12, did not pre-empt any field, but instead are improvements in the technology.

53. Rather, at the time of the inventions claimed in the '028 patent, a person of ordinary skill in the art would have recognized that radio communications systems had not addressed power control problems in the various manners that the claims of the '028 patent addressed such problems, including, for example, the problem of obtaining rapid convergence of power control at the start of, or after an interruption in, a transmission. In such prior radio communications systems, therefore, data transmissions were often received in a corrupted state if their power level was too low or extra interference was generated if their power level was too high. The claims of the '028 patent, including claim 12, provided various solutions to such problems, which in claim 12 included determinedly delaying the initial transmission of data on the uplink data channel until after the initial transmission of control information on the uplink control channel and the downlink control channel. A person of ordinary skill in the art would have recognized that the claims of the '028 patent are directed to such specific improvements in the field of radio communications and that the claims are not directed to the implementation of pre-existing practices.

54. A person of ordinary skill in the art would understand that the claims of the '028 patent are rooted in computer technology – i.e., radio communications – and comprise technological improvements of prior technologies in order to provide new functionality and overcome inefficiencies, including those noted above. The claimed solutions amount to an inventive concept for the particular problems and inefficiencies noted above, as a person of ordinary skill in the art would understand.

55. Consistent with 35 U.S.C. § 282 and the limitations of the claims of the '028 patent, a person of ordinary skill in the art also would have understood that each claim of the '028 patent (independent or dependent) relates to a separate invention distinct from other claims.

The '216 Patent

56. Philips is the owner of all rights, title and interest – including the right to bring a suit for patent infringement – in the '216 patent, entitled “Radio Communication System” (copy attached as Exhibit D hereto). The '216 patent stems from a continuation application of an application filed on January 6, 2000 (now U.S. Patent 6, 754,505).

57. Among other things, the '216 patent recognizes that in radio communication systems:

There are two basic types of communication required between a Base Station (BS) and a Mobile Station (MS) in a radio communication system. The first is user traffic, for example speech or packet data. The second is control information, required to set and monitor various parameters of the transmission channel to enable the BS and MS to exchange the required user traffic.

(Ex. D at 1:16-23.)

58. The '216 patent further recognizes that one function of control information is to enable power control of the signals to the BS from the MS, “so that the MS receives the signals from the BS with a low error rate while minimizing transmission power, to reduce interference with other cells and radio stations.” (*Id.* at 1:24-33.)

59. The '216 patent states:

A problem with these known techniques is that at the start of a transmission, or after the transmission is interrupted, the power control loops may take some time to converge satisfactorily. Until such convergence is achieved data transmissions are likely to be received in a corrupted state if their power level is too low, or to generate extra interference if their power level is too high.

(*Id.* at 1:46-52.)

60. The '216 patent addresses such problems explaining that, for example,

According to a first aspect of the present invention there is provided a radio communication system comprising a primary station and a plurality of secondary stations, the system having a communication channel between the primary station and a secondary station, the channel comprising an uplink and a downlink control channel for transmission of control information, including power control commands, and a data channel for the transmission of data, wherein power control means are provided for adjusting the power of the control and data channels in response to the power control commands and means are provided for setting the initial transmission power after a pause in transmission to that before the pause adjusted by an offset.

(*Id.* at 1:55-67.)

61. The '216 patent explains that for the setting of the initial transmission power after a pause in transmission to that before the pause adjusted by an offset, the offset may be predetermined. (*Id.* at 2:39.) The '216 patent also explains that the offset “may be determined from the difference between the last transmission power and a weighted average of the transmission power over a period (possibly predetermined) before the pause in transmission, or may be determined from a weighted sum of the power control commands applied before the pause in transmission.” (*Id.* at 2:39-45.) “In such cases the offset should be quantised to an available power control step size before it is applied.” (*Id.* at 2:45-46.)

62. The '216 patent explains that prior art methods did “not address the problem of obtaining rapid convergence of power control at the start of, or after an interruption in, a transmission.” (*Id.* at 2:51-53.)

63. In an embodiment in which the initial power is determined from a weighted sum of power control commands, the '216 patent explains that the change in power which would need to be applied after a transmission gap could be determined in the following way:

$$\Delta P(t) = P_{\text{off}} + K_1 \times (\Delta P(t-1) - P_{\text{off}}) - K_2 \times PC(t) \times PS(t)$$

where:

$\Delta P(t)$ is the change in power which would be applied after a gap, computed recursively at time t , during active transmission;

$\Delta P(0)$ could be initialised to zero;

P_{off} is an additional power offset (which may be zero);

K_1 and K_2 are empirically determined constants, which could be equal, preferably such that $0 \leq K \leq 1$. The values of these constants can be chosen to reflect the effective averaging period used in calculating the power change;

$PC(t)$ is power control command applied at time t ; and

$PS(t)$ is the power control step size used at time t .

(*Id.* at 5:27-46.)

64. The claims of the '216 patent, including claim 13, when viewed as a whole, including as an ordered combination, address difficult technical challenges in the field of radio communications. The claims of the '216 patent were not well known, routine or conventional at the time of the invention. A person of ordinary skill in the art would have recognized this fact and would have recognized that the claims represent specific improvements over the prior art and prior existing systems and methods. A person of ordinary skill in the art would have further understood that the claims of the '216 patent, including claim 13, are not directed to an abstract idea, nor are they directed to a disembodied concept or pre-existing fundamental truth, but instead are directed to real-world applications in the field of radio communications, including, for example, physical devices such as a primary station and secondary station, which are used in ways that are concrete systems that improved radio communications.

65. Furthermore, a person of ordinary skill in the art would have understood that the claims of the '216 patent, including claim 13, did not pre-empt any field, but instead are improvements in the technology of radio communications.

66. Rather, at the time of the inventions claimed in the '216 patent, a person of ordinary skill in the art would have recognized that radio communications systems had not addressed power control problems in the manner specified in some of the various claims of the '216 patent, including, for example, the problem of improving power control at the resumption of a pause and determining the first value for the transmission power after a transmission gap. A person of ordinary skill in the art would have further recognized that the specific way of improving power control in, for example, claim 13, which includes, for example, a specific means for determining the offset from a weighted sum of power control commands, was an improvement in the technology. A person of ordinary skill in the art would have recognized that the claims of the '216 patent are directed to such specific improvements in the field of radio communications and that the claims are not directed to the implementation of pre-existing practices.

67. A person of ordinary skill in the art would have understood that the claims of the '216 patent are rooted in computer technology – i.e., radio communications – and comprise technological improvements of prior technologies in order to provide new functionality and overcome inefficiencies, including those noted above. The claimed solutions amount to an inventive concept for the particular problems and inefficiencies noted above, as a person of ordinary skill in the art would have understood.

68. Consistent with 35 U.S.C. § 282 and the limitations of the claims of the '216 patent, a person of ordinary skill in the art also would have understood that each claim of the '216 patent (independent or dependent) relates to a separate invention distinct from other claims.

The '929 Patent

69. Philips is the owner of all rights, title and interest – including the right to bring a suit for patent infringement – in the '929 patent, entitled “Communication System” (copy attached as Exhibit E, hereto). The '929 patent cites to a priority application filed on May 3, 2003.

70. Among other things, the '929 patent recognizes that:

Various mobile communications systems use transmitter power control (TPC) to adapt transmitted power level to the prevailing channel conditions. The objective of TPC schemes is to maintain an adequate received signal quality despite variations in the channel conditions due to propagation distance, obstructions, or fades caused by multipath reception. If the channel quality degrades, thereby causing the received signal quality to degrade, the ... transmitter power level is increased to compensate, and when the channel quality recovers, the transmitter power level is decreased. Transmitter power control can operate in either open-loop or closed-loop form.

(Ex. E at 1:5-17.)

71. The '929 patent explains problems with open-loop and closed-loop TPC schemes:

One problem with the TPC schemes described above is that power consumption of the transmitter increases when channel conditions are poor, and therefore the schemes may not be power efficient. Another problem is that the increase in transmitted power increases the interference to other users, which can degrade system efficiency.

(*Id.* at 1:53-58.)

72. The '929 patent thus explains that in one aspect of the invention, a radio station decreases the data transmit power responsive to an indication of a reduction in channel quality according to a first criterion. (*Id.* at 1:61 to 2:3.) The '929 patent explains that “[b]y decreasing the data transmit power while the channel quality is poor, power is saved and interference is reduced.” (*Id.* at 2:4-5.) The '929 patent explains that the data block may be transmitted on a plurality of data signals simultaneously, and the decrease and increase in data transit power may occur on a subset of the data signals. (*Id.* at 2:6-9.)

73. The claims of the '929 patent, including claim 9, when viewed as a whole, including as an ordered combination, address difficult technical challenges in the field of radio communications. The claims of the '929 patent were not well known, routine or conventional at the time of the invention. A person of ordinary skill in the art would have recognized this fact and would have recognized that the claims represent specific improvements over the prior art and prior existing systems and methods. A person of ordinary skill in the art would have further understood that the claims of the '929 patent, including claim 9, are not directed to an abstract idea, nor are they directed to a disembodied concept or pre-existing fundamental truth, but instead are directed to real-world applications in the field of radio communications, including, for example, physical devices such as a radio station, which are used in ways that are concrete systems that improved radio communications.

74. Furthermore, a person of ordinary skill in the art would have understood that the claims of the '929 patent, including claim 9, did not pre-empt any field, but instead are improvements in the technology of radio communications.

75. Rather, at the time of the inventions claimed in the '929 patent, a person of ordinary skill in the art would have recognized that radio communications systems had not addressed power control problems in the manner of the claims of the '929 patent addressed such problems, including, for example, the problem of managing power of the user equipment / radio station. Some of the inventions of the '929 patent, including claim 9, recognize that if channel quality degrades to a first criterion, the radio station can reduce data transmit power, for example. If channel quality increases to a second criterion, the radio station can increase data transmit power, for example. A person of ordinary skill in the art would have recognized that the claims of the '929 patent are directed to such specific improvements in the field of radio communications.

76. A person of ordinary skill in the art would have understood that the claims of the '929 patent are rooted in computer technology – i.e., radio communications – and comprise technological improvements of prior technologies in order to provide new functionality and overcome inefficiencies, including those noted above. The claimed solutions amount to an inventive concept for the particular problems and inefficiencies noted above, as a person of ordinary skill in the art would understand.

77. Consistent with 35 U.S.C. § 282 and the limitations of the claims of the '929 patent, a person of ordinary skill in the art also would have understood that each claim of the '929 patent (independent or dependent) relates to a separate invention distinct from other claims.

The '814 Patent

78. Philips is the owner of all rights, title and interest – including the right to bring a suit for patent infringement – in the '814 patent, entitled “Addressing Available Resources for HSDPA Accesses” (copy attached as Exhibit F, hereto). The '814 patent stems from a patent application filed on December 6, 2007.

79. Among other things, the '814 patent recognizes that in UMTS, the allocation of the available transmission resources for HSDPA access are listed within a list of 15 available codes, and the code numbers for a single terminal are consecutive. (Ex. F at 1:12-19.) For signaling these sets of available resources, only two parameters are required – a starting point and a number of codes allocated to the terminal. (*Id.* at 1:19-22.)

80. The '814 patent notes that “the UMTS specification for HSDPA in FDD mode describes signalling using 7 bits for the CCS (Channelization Code Set), as well as other parameters. For the case where the list of available resources comprises up to 15 codes, this allows

all of the 120 possible configurations of starting code and number of codes to be indicated.” (*Id.* at 1:23-28.)

81. The ’814 patent states that “each mobile terminal using HSDPA is required to monitor up to four control channels (HS-SCCH) in case one of them carries control information intended for that terminal.” (*Id.* at 1:33-36.)

82. The ’814 patent further states that “[i]n practice, less than the maximum possible number of codes may have been allocated by the network for HSDPA data transmission. However, the current HS-SCCH signaling can address the whole code space.” (*Id.* at 1:37-40.)

83. As the ’814 explains, “[h]owever, the amount of signaling overhead for UMTS is potentially significant,” and therefore it would be beneficial “to minimize the number of bits used for the signaling.” (*Id.* at 1:41-43.)

84. The ’814 patent thus explains that an aim of the inventions was “to provide a method for dynamically allocating the available transmission resources, using less signaling overhead.” (*Id.* at 1:47-49.)

85. The ’814 patent explains that in one aspect of the invention, a method comprises the steps of signaling to a secondary station an association between a control signalling channel and at least one parameter describing a set of transmission resources, coding into an address at least one remaining parameter from the plurality of parameters describing the set of transmission resources, and transmitting the address to the secondary station using the control signalling channel. (*Id.* at 1:50-63.) Another aspect of the inventions proposed by the ’814 is “a secondary station comprising means for decoding an address for resources allocation as generating in the method of the first aspect of the invention.” (*Id.* at 2:1-4.)

86. The '814 patent explains that its inventions improve on the prior art, for example, because “fewer parameters are required to fully describe the possible configurations.” (*Id.* at 2:33-34.) The '814 patent further explains that “this invention permits a reduction in the number of bits used for coding a set of resources.” (*Id.* at 2:34-38.)

87. Furthermore, “[r]educing the number of signaling bits on the HS-SCCH has the benefit of reducing the proportion of the base station’s transmission power that is required for the control signalling overhead. Alternatively, it may be possible to take advantage of the reduced number of signalling bits to increase the coverage area within which the HS-SCCH signaling can be successfully received by the receiving terminals.” (*Id.* at 2:39-46.)

88. The claims of the '814 patent, including claim 10, when viewed as a whole, including as an ordered combination, address difficult technical challenges in the field of radio communications. The claims of the '814 patent were not well known, routine or conventional at the time of the invention. A person of ordinary skill in the art would have recognized this fact and would have recognized that the claims represent specific improvements over the prior art and prior existing systems and methods. A person of ordinary skill in the art would have further understood that the claims of the '814 patent, including claim 10, are not directed to an abstract idea, nor are they directed to a disembodied concept or pre-existing fundamental truth, but instead are directed to real-world applications in the field of radio communications, including, for example, physical devices such as a secondary station, which are used in ways that are concrete systems that improved radio communications.

89. Furthermore, a person of ordinary skill in the art would have understood that the claims of the '814 patent, including claim 10, did not pre-empt any field, but instead are improvements in the technology.

90. Rather, at the time of the inventions claimed in the '814 patent, a person of ordinary skill in the art would have recognized that radio communications systems had not addressed problems with transmission resources and signalling overhead in the manner that the claims of the '814 patent addressed such problems, including, for example, by reducing the number of signalling bits on the HS-SCCHs (high speed shared control channels) in the manner contemplated by the '814 patent. A person of ordinary skill in the art would have recognized that the claims of the '814 patent are directed to such specific improvements in the field of radio communications.

91. A person of ordinary skill in the art would have understood that the claims of the '814 patent are rooted in computer technology – i.e., radio communications and transmission resources between base and mobile stations – and comprise technological improvements of prior technologies in order to provide new functionality and overcome inefficiencies, including those noted above. The claimed solutions amount to an inventive concept for the particular problems and inefficiencies noted above, as a person of ordinary skill in the art would understand.

92. Consistent with 35 U.S.C. § 282 and the limitations of the claims of the '814 patent, a person of ordinary skill in the art also would have understood that each claim of the '814 patent (independent or dependent) relates to a separate invention distinct from other claims.

Count I
Infringement of U.S. Patent No. 9,178,577

93. Philips repeats and realleges the foregoing paragraphs.

94. The '577 patent is valid and enforceable.

95. Quectel has directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents, one or more claims of the '577 patent, in violation of one or more subsections of 35 U.S.C. § 271 – including at least one or more of subsections § 271(a), (b), (c), (f)

and (g) – by making, using, importing, selling, and/or offering to sell products covered by one or more claims of the '577 patent within the United States, and/or by contributing to or inducing such infringement. Quectel's Accused Products include, but are not limited to certain cellular communication modules, including EG25-G and the like.

96. In addition to direct infringement, Quectel has actively induced infringement of the '577 patent, at least by intentionally encouraging the direct infringement of one or more claims of the '577 patent by others. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '577 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '577 patent. Quectel provides instructions, user manuals, advertising, and/or marketing materials which facilitate, direct, or encourage such infringing use with knowledge thereof. End users of devices with the Accused Products in them test and/or operate the devices in the United States, thereby also performing the claimed methods and directly infringing claims of the '577 patent.

97. Quectel is also a contributory infringer of one or more claims of the '577 patent, at least because it sells, offers to sell, or imports into the U.S. a material or apparatus for use in practicing subject matter claimed in the '577 patent, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in such infringement, and not a staple article or commodity of commerce suitable for substantial non-infringing use. The Accused Products have no substantial non-infringing use. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '577 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '577 patent.

98. For example, the Accused Products infringe at least dependent claim 18 of the ‘577 patent. Each Accused Product is a secondary station.

99. Each Accused Product includes at least one antenna for use in a radio communication system having a communication channel comprising a plurality of paths between a primary station having a plurality of antennas and the secondary station.

100. Each Accused Product includes a transceiver.

101. The transceiver in each Accused Product is configured to receive a plurality of data packets transmitted substantially simultaneously by the primary station, the packets being transmitted via different subsets of the plurality of paths.

102. The transceiver in each Accused Product is further configured to signal a determination of which data packets are received correctly to the primary station.

103. The transceiver in each Accused Product is further configured to signal to the primary station a number of simultaneous data streams that the secondary station is capable of receiving.

104. The transceiver in each Accused Product is further configured to receive a re-transmission of incorrectly received data packets via selected ones of the subsets of the plurality of paths, said selected ones of the subsets of the plurality of paths corresponding to the subsets of the plurality of paths utilized for an initial transmission of the incorrectly received data packets.

105. In each Accused Product, at least one of a modulation scheme and a coding scheme for re-transmission of said data packets on said selected ones of the subsets of the plurality of paths is different from the modulation and coding scheme utilized for said selected ones of the subsets of the plurality of paths during said initial transmission of said data packets.

106. In each Accused Product, the transceiver is also configured to transmit, substantially simultaneously, acknowledgements corresponding to each of the simultaneously received data packets, each acknowledgement being transmitted via a different subset of the plurality of paths.

107. The Accused Products practice certain LTE standards, including 3GPP TS 36.211, 3GPP TS 36.212, 3GPP TS 36.213, and 3GPP TS 36.321, including functionality infringing the '577 patent.

108. With each Accused Product, a LTE user equipment ("UE") has at least one antenna, and one of the downlink channels used for communication between an eNodeB and a UE is the physical downlink shared channel ("PDSCH"), as shown in 3GPP TS 36.211 § 6.3, which provides in part: "The baseband signal representing a downlink physical channel is defined in terms of the following steps: ... mapping of the complex-valued modulation symbols onto one or several transmission layers[;] precoding of the complex-valued modulation symbols on each layer for transmission on the antenna ports" The "antenna ports" are antennas. Each "layer" corresponds to a different path between the primary station and secondary station.

109. With each Accused Product, a LTE UE is designed to receive the packets transmitted by the eNodeB using the PDSCH, as shown in 3GPP TS 36.211 § 6.3.3, which provides that at the eNodeB, "[t]he complex-valued modulation symbols for each of the code words to be transmitted are....." 3GPP TS 36.212 § 5.3.2.5 further provides that each "transport block" is transported as a "codeword" at the PHY layer: "This sequence of coded bits corresponding to one transport block after code block concatenation is referred to as one codeword." 3GPP TS 36.321 § 5.3.2.1 further provides that each respective transport block ("TB") corresponds to a "data packet" and two TB can be transmitted simultaneously: "When the

physical layer is configured for spatial multiplexing [3GPP TR 36.213], one or two TBs are expected per subframe and they are associated with the same HARQ process.”

110. With each Accused Product, 3GPP TS 36.211 § 6.3.3 further provides that “... each of the codewords to be transmitted are mapped onto one or several layers.” Because the “layers” precoded with different precoding coefficients result in different beam directions, there are different signal paths between the primary and secondary station.

111. With each Accused Product, 3GPP TS 36.321 § 5.3.2.1 further provides: “When the physical layer is configured for spatial multiplexing [3GPP TR 36.213], one or two TBs are expected per subframe and they are associated with the same HARQ process. Otherwise, one TB is expected per subframe.” And, 3GPP TS 36.321 § 5.3.2.2 shows that the UE determines whether each packet is received correctly, providing:

For each subframe where a transmission takes place for the HARQ process, one or two (in case of spatial multiplexing) TBs and the associated HARQ information are received from the HARQ entity ...

The UE then shall:

- if this is a new transmission:
- replace the data currently in the soft buffer for this TB with the received data.
- else if this is a retransmission:
- if the data has not yet been successfully decoded:
- combine the received data with the data currently in the soft buffer for this TB.
- ...
- attempt to decode the data in the soft buffer for this TB;
- if the data in the soft buffer was successfully decoded for this TB:
- ...
- else if this is the first successful decoding of the data in the soft buffer for this TB:
- deliver the decoded MAC PDU to the disassembly and demultiplexing entity.
- generate a positive acknowledgement (ACK) of the data in this TB.
- else:
- generate a negative acknowledgement (NACK) of the data in this TB.

112. With each Accused Product, 3GPP TS 36.213 §10.1 describes that the UE signals this determination to the eNodeB for each packet as follows:

... the following combinations of uplink control information on PUCCH are supported:

- Format 1a for 1-bit HARQ-ACK ...
- Format 1b for 2-bit HARQ-ACK ...

113. With each Accused Product, 3GPP TS 36.213 §10.1 also provides: “For FDD, the UE shall use PUCCH resource $n_{\text{PUCCH}}^{(l)}$ for transmission of HARQ-ACK in subframe n, \dots ”

114. With each Accused Product, 3GPP TS 36.321 § 5.3.2.1 and 3GPP TS 36.211 § 5.4.1 describe the secondary station notifying the primary station whether each data packet is received correctly.

115. With each Accused Product, 3GPP TS 36.321 § 5.3.2.1 provides: “When the physical layer is configured for spatial multiplexing [3GPP TR 36.213], one or two TBs are expected per subframe and they are associated with the same HARQ process. Otherwise, one TB is expected per subframe.”

116. With each Accused Product, 3GPP TS 36.211 § 5.4.1 provides: “For PUCCH formats 1a and 1b, one or two explicit bits are transmitted, respectively. The block of bits $b(0), \dots, b(M_{\text{bit}} - 1)$ shall be modulated as described in Table 5.4.1-1, resulting in a complex-valued symbol $d(0)$. The modulation schemes for the different PUCCH formats are given by Table 5.4-1.”

117. Table 5.4.1-1 is shown here:

Table 5.4.1-1: Modulation symbol $d(0)$ for PUCCH formats 1a and 1b.

PUCCH format	$b(0), \dots, b(M_{\text{bit}} - 1)$	$d(0)$
1a	0	1
	1	-1
1b	00	1
	01	$-j$
	10	j
	11	-1

118. TS 36.211 § 5.4.1 further provides:

The complex-valued symbol $d(0)$ shall be multiplied with a cyclically shifted length $N_{\text{seq}}^{\text{PUCCH}} = 12$ sequence $r_{u,v}^{(\alpha)}(n)$ according to

$$y(n) = d(0) \cdot r_{u,v}^{(\alpha)}(n), \quad n = 0, 1, \dots, N_{\text{seq}}^{\text{PUCCH}} - 1$$

where $r_{u,v}^{(\alpha)}(n)$ is defined by section 5.5.1 with $M_{\text{sc}}^{\text{RS}} = N_{\text{seq}}^{\text{PUCCH}}$. The cyclic shift α varies between symbols and slots as defined below.

The block of complex-valued symbols $y(0), \dots, y(N_{\text{seq}}^{\text{PUCCH}} - 1)$ shall be scrambled by $S(n_s)$ and block-wise spread with the orthogonal sequence $w_{n_{\text{oc}}}(i)$ according to

$$z(m \cdot N_{\text{SF}}^{\text{PUCCH}} \cdot N_{\text{seq}}^{\text{PUCCH}} + m \cdot N_{\text{seq}}^{\text{PUCCH}} + n) = S(n_s) \cdot w_{n_{\text{oc}}}(m) \cdot y(n) \dots$$

119. With each Accused Product, 3GPP TS 36.213 § 7.2.2 shows that an indication of a number of simultaneous data streams that the secondary station is capable of receiving or processing is indicated by the Rank Indicator (“RI”) sent by the UE to the eNodeB, providing: “A UE is semi-statically configured by higher layers to periodically feed back different CQI, PMI, and RI on the PUCCH using the reporting modes given in Table 7.2.2-1 and described below.”

Count II **Infringement of U.S. Patent No. 9,635,599**

120. Philips repeats and realleges the foregoing paragraphs.

121. The ’599 patent is valid and enforceable.

122. Quectel has directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents, one or more claims of the ’599 patent, in violation of one or more subsections of 35 U.S.C. §271 – including at least one or more of subsections §271(a), (b), (c), (f) and (g) – by making, using, importing, selling, and/or offering to sell products covered by one or more claims of the ’599 patent within the United States, and/or by contributing to or inducing such infringement. Quectel’s Accused Products include, but are not limited to certain cellular communication modules, including EG25-G and the like.

123. In addition to direct infringement, Quectel has actively induced infringement of the ’599 patent, at least by intentionally encouraging the direct infringement of one or more claims

of the '599 patent by others. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '599 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the patent application for the '599 patent, with the '599 patent then issuing on April 25, 2017. Quectel provides instructions, user manuals, advertising, and/or marketing materials which facilitate, direct, or encourage such infringing use with knowledge thereof. End users of devices with the Accused Products in them test and/or operate the devices in the United States, thereby also performing the claimed methods and directly infringing claims of the '599 patent.

124. Quectel is also a contributory infringer of one or more claims of the '599 patent, at least because it sells, offers to sell, or imports into the U.S. a material or apparatus for use in practicing subject matter claimed in the '599 patent, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in such infringement, and not a staple article or commodity of commerce suitable for substantial non-infringing use. The Accused Products have no substantial non-infringing use. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '599 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the patent application for the '599 patent, with the '599 patent then issuing on April 25, 2017.

125. For example, the Accused Products infringe at least claim 20 of the '599 patent.

126. With each Accused Product, it is used for operating a radio communication system having a communication channel comprising a plurality of paths between a primary station having a plurality of antennas and a secondary station having at least one antenna.

127. With each Accused Product, a primary station transmits substantially simultaneously a plurality of data packets to a secondary station, each data packet being transmitted via a different subset of the plurality of paths.

128. With each Accused Product, the secondary station receives the plurality of data packets.

129. With each Accused Product, the secondary station determines whether each data packet is received correctly.

130. With each Accused Product, the secondary station notifies the primary station whether each data packet is received correctly, wherein notifying the primary station whether each data packet is received correctly comprises transmitting, a positive acknowledgement (ACK) for each of the plurality of data packets that are received correctly and a negative acknowledgement (NACK) for each of the plurality of data packets that are not received correctly, and wherein the same channelization and scrambling parameters are utilized for transmission of each positive acknowledgment (ACK) or negative acknowledgment (NACK) corresponding to said plurality of data packets.

131. With each Accused Product, the secondary station sends the primary station an indication of a number of simultaneous data streams that the secondary station is capable of receiving or processing.

132. With each Accused Product, the secondary station receives a retransmission of incorrectly received data packets via selected ones of the subsets of the plurality of paths utilized for an initial transmission of the incorrectly received data packets.

133. The Accused Products practice certain LTE standards, including 3GPP TS 36.211, 3GPP TS 36.212, 3GPP TS 36.213, and 3GPP TS 36.321, including functionality infringing the '599 patent.

134. With each Accused Product, a LTE user equipment ("UE") has at least one antenna, and one of the downlink channels used for communication between an eNodeB and a UE is the physical downlink shared channel ("PDSCH"), as shown in 3GPP TS 36.211 § 6.3, which provides in part: "The baseband signal representing a downlink physical channel is defined in terms of the following steps: ... mapping of the complex-valued modulation symbols onto one or several transmission layers[:]; precoding of the complex-valued modulation symbols on each layer for transmission on the antenna ports" The "antenna ports" are antennas. Each "layer" corresponds to a different path between the primary station and secondary station.

135. With each Accused Product, a LTE UE is designed to receive the packets transmitted by the eNodeB using the PDSCH, as shown in 3GPP TS 36.211 § 6.3.3, which provides that at the eNodeB, "[t]he complex-valued modulation symbols for each of the code words to be transmitted are...." 3GPP TS 36.212 § 5.3.2.5 further provides that each "transport block" is transported as a "codeword" at the PHY layer: "This sequence of coded bits corresponding to one transport block after code block concatenation is referred to as one codeword." 3GPP TS 36.321 § 5.3.2.1 further provides that each respective transport block ("TB") corresponds to a "data packet" and two TB can be transmitted simultaneously: "When the physical layer is configured for spatial multiplexing [3GPP TR 36.213], one or two TBs are expected per subframe and they are associated with the same HARQ process."

136. With each Accused Product, 3GPP TS 36.211 § 6.3.3 further provides that "... each of the codewords to be transmitted are mapped onto one or several layers." Because the

“layers” precoded with different precoding coefficients result in different beam directions, there are different signal paths between the primary and secondary station.

137. With each Accused Product, 3GPP TS 36.321 § 5.3.2.1 further provides: “When the physical layer is configured for spatial multiplexing [3GPP TR 36.213], one or two TBs are expected per subframe and they are associated with the same HARQ process. Otherwise, one TB is expected per subframe.” And, 3GPP TS 36.321 § 5.3.2.2 shows that the UE determines whether each packet is received correctly, providing:

For each subframe where a transmission takes place for the HARQ process, one or two (in case of spatial multiplexing) TBs and the associated HARQ information are received from the HARQ entity ...

The UE then shall:

- if this is a new transmission:
- replace the data currently in the soft buffer for this TB with the received data.
- else if this is a retransmission:
- if the data has not yet been successfully decoded:
- combine the received data with the data currently in the soft buffer for this TB.
- ...
- attempt to decode the data in the soft buffer for this TB;
- if the data in the soft buffer was successfully decoded for this TB:
- ...
- else if this is the first successful decoding of the data in the soft buffer for this TB:
- deliver the decoded MAC PDU to the disassembly and demultiplexing entity.
- generate a positive acknowledgement (ACK) of the data in this TB.
- else:
- generate a negative acknowledgement (NACK) of the data in this TB.

138. With each Accused Product, 3GPP TS 36.213 §10.1 describes that the UE signals this determination to the eNodeB for each packet as follows:

... the following combinations of uplink control information on PUCCH are supported:

- *Format 1a for 1-bit HARQ-ACK ...*
- *Format 1b for 2-bit HARQ-ACK ...*

139. With each Accused Product, 3GPP TS 36.213 §10.1 also provides: “For FDD, the UE shall use PUCCH resource $n_{\text{PUCCH}}^{(l)}$ for transmission of HARQ-ACK in subframe n, \dots ”

140. With each Accused Product, 3GPP TS 36.321 § 5.3.2.1 and 3GPP TS 36.211 § 5.4.1 describe the secondary station notifying the primary station whether each data packet is received correctly.

141. With each Accused Product, 3GPP TS 36.321 § 5.3.2.1 provides: “When the physical layer is configured for spatial multiplexing [3GPP TR 36.213], one or two TBs are expected per subframe and they are associated with the same HARQ process. Otherwise, one TB is expected per subframe.”

142. With each Accused Product, 3GPP TS 36.211 § 5.4.1 provides: “For PUCCH formats 1a and 1b, one or two explicit bits are transmitted, respectively. The block of bits $b(0), \dots, b(M_{\text{bit}} - 1)$ shall be modulated as described in Table 5.4.1-1, resulting in a complex-valued symbol $d(0)$. The modulation schemes for the different PUCCH formats are given by Table 5.4-1.”

143. Table 5.4.1-1 is shown here:

Table 5.4.1-1: Modulation symbol $d(0)$ for PUCCH formats 1a and 1b.

PUCCH format	$b(0), \dots, b(M_{\text{bit}} - 1)$	$d(0)$
1a	0	1
	1	-1
1b	00	1
	01	$-j$
	10	j
	11	-1

144. 3GPP TS 36.211 § 5.4.1 further provides:

The complex-valued symbol $d(0)$ shall be multiplied with a cyclically shifted length $N_{\text{seq}}^{\text{PUCCH}} = 12$ sequence $r_{u,v}^{(\alpha)}(n)$ according to

$$y(n) = d(0) \cdot r_{u,v}^{(\alpha)}(n), \quad n = 0, 1, \dots, N_{\text{seq}}^{\text{PUCCH}} - 1$$

where $r_{u,v}^{(\alpha)}(n)$ is defined by section 5.5.1 with $M_{\text{sc}}^{\text{RS}} = N_{\text{seq}}^{\text{PUCCH}}$. The cyclic shift α varies between symbols and slots as defined below.

The block of complex-valued symbols $y(0), \dots, y(N_{\text{seq}}^{\text{PUCCH}} - 1)$ shall be scrambled by

$S(n_s)$ and block-wise spread with the orthogonal sequence $w_{n_{oc}}(i)$ according to

$$z\left(m \cdot N_{SF}^{PUCCH} \cdot N_{seq}^{PUCCH} + m \cdot N_{seq}^{PUCCH} + n\right) = S(n_s) \cdot w_{n_{oc}}(m) \cdot y(n) \dots$$

145. With each Accused Product, 3GPP TS 36.213 § 7.2.2 shows that an indication of a number of simultaneous data streams that the secondary station is capable of receiving or processing is indicated by the Rank Indicator (“RI”) sent by the UE to the eNodeB, providing: “A UE is semi-statically configured by higher layers to periodically feed back different CQI, PMI, and RI on the PUCCH using the reporting modes given in Table 7.2.2-1 and described below.”

Count III
Infringement of U.S. Patent No. 7,089,028

146. Philips repeats and realleges the foregoing paragraphs.

147. The ’028 patent is valid and enforceable.

148. Quectel has directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents, one or more claims of the ’028 patent, in violation of one or more subsections of 35 U.S.C. §271 – including at least one or more of subsections §271(a), (b), (c), (f) and (g) – by making, using, importing, selling, and/or offering to sell products covered by one or more claims of the ’028 patent within the United States, and/or by contributing to or inducing such infringement. Quectel’s Accused Products include, but are not limited to certain cellular communication modules, including the EG25-G and the like.

149. In addition to direct infringement, Quectel has actively induced infringement of the ’028 patent, at least by intentionally encouraging the direct infringement of one or more claims of the ’028 patent by others. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the ’028 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the ’028 patent. Quectel provides instructions, user manuals, advertising,

and/or marketing materials which facilitate, direct, or encourage such infringing use with knowledge thereof. End users of devices with the Accused Products in them test and/or operate the devices in the United States, thereby also performing the claimed methods and directly infringing claims of the '028 patent.

150. Quectel is also a contributory infringer of one or more claims of the '028 patent, at least because it sells, offers to sell, or imports into the U.S. a material or apparatus for use in practicing subject matter claimed in the '028 patent, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in such infringement, and not a staple article or commodity of commerce suitable for substantial non-infringing use. The Accused Products have no substantial non-infringing use. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '028 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '028 patent.

151. For example, the Accused Products infringe at least claim 12 of the '028 patent.

152. Each Accused Product includes a means for transmitting a request for resources to a primary station.

153. Each Accused Product includes a means for receiving an acknowledgment of a reception of the request for resources by the primary station.

154. With each Accused Product, subsequent to a reception of the acknowledgement by the secondary station, control information is initially transmitted on an uplink control channel and a downlink control channel between the primary station and the secondary station.

155. With each Accused Product, subsequent to the reception of the acknowledgement by the secondary station, data is initially transmitted on an uplink data channel from the secondary station to the primary station.

156. With each Accused Product, the initial transmission of data on the uplink data channel is determinedly delayed until after the initial transmission of control information on the uplink control channel and the downlink control channel.

157. Each Accused Product includes a power control means for adjusting power levels of the uplink control channel prior to the initial transmission of the data on the uplink data channel.

158. The Accused Products practice certain UMTS standards, including 3GPP TS 23.002, 3GPP TS 25.211, 3GPP TS 25.214, and 3GPP TS 25.331, including functionality infringing the '028 patent.

159. With each Accused Product, as described in 3GPP TS 23.002 § 4.2 and § 4.3, in a UMTS cellular system, the basic entities include the Access Network (“AN”) and Mobile Station (“MS”). The AN includes one or more Node Bs, each of which is the network component serving one cell, i.e. a base station (BS). Furthermore, in 3GPP TS 25.214 § 6.1, it describes that the random access procedure, used by a MS to request resources from a BS, includes the MS transmitting a request to the BS and receiving an acknowledgement of the request.

160. With each Accused Product, in 3GPP TS 25.211 §5.2.1 and §5.3.2, it describes that when the request is for a dedicated channel this is established after reception of the acknowledgement, and both uplink and downlink include a Dedicated Physical Control Channel (DPCCH). The control channels are used to carry control information generated at Layer 1.

161. With each Accused Product, in 3GPP TS 25.211 § 5.2.1, it describes that the uplink includes a Dedicated Physical Data Channel (“DPDCH”), which is used to carry data on a DCH transport channel.

162. With each Accused Product, in 3GPP TS 25.214 § 4.3.2.3 (b), (d), it describes that during physical channel establishment, the downlink control channel is transmitted first, followed by the uplink control channel. The uplink data channel is transmitted after a power control preamble of N_{pcp} radio frames. In 3GPP TS 25.331 § 8.6.6.30 and §10.3.6.91, it further describes that N_{pcp} , which can be between 0 and 7, is signalled by the network and, if non-zero, results in a predetermined delay.

Count IV
Infringement of U.S. Patent No. 8,195,216

163. Philips repeats and realleges the foregoing paragraphs.

164. The ’216 patent is valid and enforceable.

165. Quectel has directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents, one or more claims of the ’216 patent, in violation of one or more subsections of 35 U.S.C. §271 – including at least one or more of subsections §271(a), (b), (c), (f) and (g) – by making, using, importing, selling, and/or offering to sell products covered by one or more claims of the ’216 patent within the United States, and/or by contributing to or inducing such infringement. Quectel’s Accused Products include, but are not limited to certain cellular communication modules, including the EG25-G and the like.

166. In addition to direct infringement, Quectel has actively induced infringement of the ’216 patent, at least by intentionally encouraging the direct infringement of one or more claims of the ’216 patent by others. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the ’216 patent

and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '216 patent. Quectel provides instructions, user manuals, advertising, and/or marketing materials which facilitate, direct, or encourage such infringing use with knowledge thereof. End users of devices with the Accused Products in them test and/or operate the devices in the United States, thereby also performing the claimed methods and directly infringing claims of the '216 patent.

167. Quectel is also a contributory infringer of one or more claims of the '216 patent, at least because it sells, offers to sell, or imports into the U.S. a material or apparatus for use in practicing subject matter claimed in the '216 patent, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in such infringement, and not a staple article or commodity of commerce suitable for substantial non-infringing use. The Accused Products have no substantial non-infringing use. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '216 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '216 patent.

168. For example, the Accused Products infringe at least claim 13 of the '216 patent.

169. Each Accused Product is for use in a radio communication system having a communication channel between the secondary station and a primary station. In each Accused Product, the channel includes an uplink and a downlink control channel for transmission of control information, including power control commands. In each Accused Product the channel also includes a data channel for the transmission of data.

170. Each Accused Product includes a power control means for adjusting the power of the uplink control and data channels in response to the downlink power control commands.

171. Each Accused Product includes a means for setting an initial transmission power after an interruption in transmission to that before the interruption adjusted by an offset.

172. Each Accused Product includes a means for determining the offset from a weighted sum of power control commands in accordance with an equation $\Delta P(t) = K_1 \Delta P(t-1) - K_2 PC(t) PS(t)$, where $\Delta P(t)$ is the offset computed at a time t of a last power control command before the interruption, $\Delta P(t-1)$ is a previously-determined offset, $PC(t)$ is the power control command applied at the time t , $PS(t)$ is the size of the power control step applied at the time t , K_1 and K_2 are constants and $\Delta P(0)$ is set to zero at the start of a transmission or immediately after a gap, and in that means are provided for quantizing the offset to an integer multiple of a minimum power control step size supported by the secondary station.

173. The Accused Products practice certain standards, including 3GPP TS 23.002, 3GPP TS 25.101, 3GPP TS 25.211, and 3GPP TS 25.214, including functionality infringing the '216 patent.

174. With each Accused Product, as described in 3GPP TS 23.002 § 4.2, § 4.3, in a UMTS cellular system, the basic entities include the Access Network ("AN") and Mobile Station ("MS"). The AN includes one or more Node Bs, each of which is the network component serving one cell, i.e. a base station ("BS"). Furthermore, in 3GPP TS 25.211 § 5.2.1 and § 5.3.2, it describes that when a dedicated channel exists on a radio link, the uplink comprises one control channel (the Dedicated Physical Control Channel ("DPCCH")) and zero or more data channels (Dedicated Physical Data Channel ("DPDCH")). The downlink comprises a control channel (DPCCH) and a data channel (DPDCH). TPC ("Transmit Power Control") commands are transmitted on both control channels.

175. With each Accused Product, in 3GPP TS 25.214 § 5.1.2.1, it describes that the uplink transmit power control procedure simultaneously controls the power of a DPCCH and its corresponding DPDCHs. The relative transmit power offset between DPCCH and DPDCHs is determined by the network.

176. With each Accused Product, in 3GPP TS 25.214 § 5.1.2.3, it describes that at the start of the first slot after an uplink transmission gap the MS changes the power of the uplink DPCCH by an amount Δ_{DPCCH} relative to the power in the most recently transmitted uplink slot.

177. With each Accused Product, in 3GPP TS 25.214 § 5.1.2.3, it describes that in Initial Transmit Power (“ITP”) mode 1, the change in transmit power of the uplink DPCCH (when there is no change in the number of pilot bits per slot) is the most recent value of δ_i , where $\delta_i = 0.9375\delta_{i-1} - 0.96875TPC_cmd_i\Delta_{TPC}k_{sc}$. The terms in this equation correspond to those in the claim as follows: $\Delta P(t) = \delta_i$; $K_1 = 0.9375$; $K_2 = -0.96875k_{sc}$, where k_{sc} is 0 or 1; $PC(t) = TPC_cmd_i$, the derived power control command; and $PS(t) = \Delta_{TPC}$, the power control step size.

178. With each Accused Product, in 3GPP TS 25.101 § 6.4.2.1.1 and § 6.5.4.1, it describes that the minimum power control step size supported by the MS is 1dB. The offset is rounded to the closest integer dB value, which is therefore a multiple of the minimum power control step size.

Count V
Infringement of U.S. Patent No. 8,134,929

179. Philips repeats and realleges the foregoing paragraphs.

180. The '929 patent is valid and enforceable.

181. Quectel has directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents, one or more claims of the '929 patent, in violation of one or more subsections of 35 U.S.C. §271 – including at least one or more of subsections §271(a), (b), (c), (f)

and (g) – by making, using, importing, selling, and/or offering to sell products covered by one or more claims of the '929 patent within the United States, and/or by contributing to or inducing such infringement. Quectel's Accused Products include, but are not limited to certain cellular communication modules, including the EG25-G and the like.

182. In addition to direct infringement, Quectel has actively induced infringement of the '929 patent, at least by intentionally encouraging the direct infringement of one or more claims of the '929 patent by others. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '929 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '929 patent. Quectel provides instructions, user manuals, advertising, and/or marketing materials which facilitate, direct, or encourage such infringing use with knowledge thereof. End users of devices with the Accused Products in them test and/or operate the devices in the United States, thereby also performing the claimed methods and directly infringing claims of the '929 patent.

183. Quectel is also a contributory infringer of one or more claims of the '929 patent, at least because it sells, offers to sell, or imports into the U.S. a material or apparatus for use in practicing subject matter claimed in the '929 patent, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in such infringement, and not a staple article or commodity of commerce suitable for substantial non-infringing use. The Accused Products have no substantial non-infringing use. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '929 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '929 patent.

184. For example, the Accused Products infringe at least claim 9 of the '929 patent.

185. Each Accused Product includes a transmitter means for transmitting over a channel in a predetermined time period (0 to t_F) a data block.

186. Each Accused Product includes information symbols (I) and parity check symbols (C).

187. Each Accused Product includes a receiving means for receiving a Transmitter Power Control ("TPC") command indicating either a reduction or an increase in channel quality.

188. Each Accused Product includes a control means responsive to the indication of a reduction in channel quality according to a first criterion for decreasing the data transmit power and responsive to the indication within the predetermined time period of an increase in channel quality according to a second criterion for increasing the data transmit power.

189. In each Accused Product, a radio station transmits multiple data signals simultaneously so that data transmit power variation occurs on a subset of the multiple data signals.

190. In each Accused Product, the indication of a reduction in channel quality according to the first criterion is an indication to increase transmit power above a predetermined threshold (P_2).

191. The Accused Products practice certain UMTS standards, including 3GPP TS 23.002, 3GPP TS 25.211, 3GPP TS 25.212, 3GPP TS 25.213, and 3GPP TS 25.214, including functionality infringing the '929 patent.

192. With each Accused Product, as described in 3GPP TS 23.002 § 4.2 and § 4.2, in a UMTS cellular system, the basic entities include the Access Network ("AN") and Mobile Station ("MS"). The AN includes one or more Node Bs, each of which is the network component serving

one cell, e.g., a base station (“BS”). In 3GPP TS 25.211 § 4.1.1.2 and § 5.2.1.3, it describes that the Enhanced Dedicated Channel (“E-DCH”) is an uplink transport channel, carried on the E-DPDCH (“E-DCH Dedicated Physical Channel”). Each 10ms radio frame is divided into 5 subframes, of length 2ms, each subframe further comprising 3 slots. In 3GPP TS 25.212 § 4.2.13.9 and § 4.8, it describes that the E-DCH transmits data in transport blocks, one per Transmission Time Interval (“TTI”). The length of TTI is either 2ms or 10ms. Parity check symbols, comprising a 24-bit CRC, are added to each transport block before transmission.

193. With each Accused Product, in 3GPP TS 25.213 § 4.2.1.3 and 3GPP TS 25.214 § 5.1.2.6, it describes that closed loop control of transmit power creates a relationship between it and channel quality. The power of the k^{th} E-DPDCH is determined from its associated gain factor $\beta_{ed,k}$. If the transmit power would exceed the maximum allowed value, the first criterion for reduced channel quality is met. In response, the gain factors $\beta_{ed,k}$ are all reduced by an equal scaling factor, thereby decreasing the data transmit power.

194. With each Accused Product, in 3GPP TS 25.214 § 5.1.2.6, it describes that if a received power control command indicates a reduction in (unscaled) transmit power to below the maximum allowed value, the second criterion for increased channel quality is met. A scaling factor is no longer applied to the gain factors $\beta_{ed,k}$ and the data transmit power is increased.

195. With each Accused Product, in 3GPP TS 25.213 § 4.2.1 and 3GPP TS 25.214 § 5.1.2.6, it describes that the MS can transmit simultaneously one DPDCH and two E-DPDCHs. In this case, scaling is applied to the E-DPDCHs but not the DPDCH.

Count VI
Infringement of U.S. Patent No. 10,257,814

196. Philips repeats and realleges the foregoing paragraphs.

197. The '814 patent is valid and enforceable.

198. Quectel has directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents, one or more claims of the '814 patent, in violation of one or more subsections of 35 U.S.C. §271 – including at least one or more of subsections §271(a), (b), (c), (f) and (g) – by making, using, importing, selling, and/or offering to sell products covered by one or more claims of the '814 patent within the United States, and/or by contributing to or inducing such infringement. Quectel's Accused Products include, but are not limited to certain cellular communication modules, including EG25-G and the like.

199. In addition to direct infringement, Quectel has actively induced infringement of the '814 patent, at least by intentionally encouraging the direct infringement of one or more claims of the '814 patent by others. Prior to this action, Quectel had knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '814 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the application for the '814 patent. Quectel provide instructions, user manuals, advertising, and/or marketing materials which facilitate, direct, or encourage such infringing use with knowledge thereof. End users of devices with the Accused Products in them test and/or operate the devices in the United States, thereby also performing the claimed methods and directly infringing claims of the '814 patent.

200. Quectel is also a contributory infringer of one or more claims of the '814 patent, at least because it sells, offers to sell, or imports into the U.S. a material or apparatus for use in practicing subject matter claimed in the '814 patent, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in such infringement, and not a staple article or commodity of commerce suitable for substantial non-infringing use. The Accused Products have no substantial non-infringing use. Prior to this action, Quectel had

knowledge of and intended to cause direct infringement by others and/or Quectel was willfully blind to the existence of the '814 patent and such infringement. For example, as early as December 29, 2015, Quectel received a letter from Philips identifying the '814 patent application.

201. For example, the Accused Products infringe at least claim 10 of the '814 patent.

202. When the Accused Products are used, they comprise a method of indicating, to a secondary station, a set of at least one transmission resource from among a plurality of transmission resources, with the indicated set of at least one transmission resource being described by a plurality of parameters.

203. When the method of the Accused Products are used, there is a preconfiguring, at the secondary station, of at least one association between a control signalling channel selected from among a plurality of control signaling channels, and a value of at least one fixed parameter describing the indicated set of at least one transmission resource.

204. When the Accused Products are used, there is a coding into an address of at least one remaining dynamic parameter from the plurality of parameters describing the indicated set of at least one transmission resource.

205. When the Accused Products are used, there is a transmitting of the address, to the secondary station, using the selected control signalling channel.

206. When the Accused Products are used, the at least one remaining dynamic parameter comprises an indication of a starting point within a list of said plurality of transmission resources.

207. The Accused Products practice certain standards, including 3GPP TS 25.211, 3GPP TS 25.212, 3GPP TS 25.213, and 3GPP TS 25.331, including functionality infringing the '814 patent, including claim 10 of the '814 patent.

208. With each Accused Product, in 3GPP TS 25.201 § 4.2.3, 3GPP TS 25.211 § 5.3.3.12, and 3GPP TS 25.212 § 4.6.3, it describes that a UMTS Mobile Station (“MS”) is a secondary station. The available transmission resources are the channelization codes, and the parameters are the bits of the channelization-code-set information (7 bits, $x_{ccs,1}, \dots, x_{ccs,7}$) which are transmitted on the High Speed Shared Control Channel (“HS-SCCH”).

209. With each Accused Product, in 3GPP TS 25.331 § 10.3.6.23a, § 10.3.6.36a, 3GPP TS 25.212 § 4.6.2.3, and 3GPP TS 25.213 § 5.2.1, it describes that RRC signalling indicates whether 64QAM is configured, by the parameter “Downlink 64QAM configured” in the “Downlink HS-PDSCH Information” information element. There are a plurality of HS-SCCH, each with an associated number. When 64QAM is configured and $x_{ms,l} = 1$, the seventh channelization code-set bit indicates which of 16QAM or 64QAM is used. There is a preconfigured association between the HS-SCCH number and a corresponding range of channelization code-sets, the association depending only on whether the HS-SCCH number is odd or even and the fixed parameter being 1 if the HS-SCCH number is odd and 0 if it is even.

210. With each Accused Product, in 3GPP TS 25.212 § 4.6.2.3, it describes that the address is the first six channelization code-set bits.

211. With each Accused Product, in 3GPP TS 25.212 § 4.6.3 and § 4.6.2.3, it describes that the dynamic parameters are the values of the first six channelization code-set bits, which are coded into the address.

Count VII
Declaratory Judgment Related to FRAND and ETSI Matters

212. Philips repeats and realleges the foregoing paragraphs.

213. As discussed above, Philips has repeatedly offered to license rights to its world-wide portfolio including the Asserted Patents (and others) to Quectel, but Quectel has refused to

accept Philips' offers to license the world-wide portfolio. Philips' offers to license the patents have been on fair, reasonable and non-discriminatory ("FRAND") terms, pursuant to ETSI policy.

214. Despite notice in 2015 of the Asserted Patents and others in Philips' world-wide portfolio, followed by years of additional communications between the parties in which Philips offered and demonstrated its willingness to provide a world-wide license in those patents to Quectel, Quectel has steadfastly refused to accept Philips' FRAND licensing offers and acted as a "hold out" while infringing Philips' patents in a manner consistent with an "efficient infringement" tactical approach.

215. Quectel has thus not committed to accept Philips' FRAND offers and license Philips' world-wide patents under such FRAND terms, even if determined by this Court. Quectel should therefore not be permitted to ask this Court, or any other court worldwide, to determine a FRAND or ETSI terms or raise any other FRAND or ETSI defenses. This Court has dismissed counts seeking FRAND determinations observing that "there has been no sworn affidavit by either company that they would sign a license." *InterDigital Communs., Inc. v. ZTE Corp.*, C.A. No. 13-00009-RGA, 2014 WL 2206218, *3 (D. Del. May 28, 2014). In particular, Quectel should not be permitted to circumvent this Court's jurisdiction by asking a foreign court to address FRAND or ETSI matters. Absent a sworn affidavit by Quectel stating that it would sign a license to Philips' world-wide cellular communications patents under FRAND and ETSI rates and terms determined by this Court, Philips requests that the Court enter judgment that Quectel may not raise any claim seeking a determination of the FRAND rates and terms or raise any other FRAND claims in this or any other court world-wide, especially including seeking an anti-suit injunction against these proceedings or instituting any other form of collateral attack to this Court's proper jurisdiction and judgment.

216. An actual controversy has arisen and now exists between Philips and Quectel, which have adverse legal interests, regarding whether Quectel may raise such FRAND and ETSI-related claims, having refused and continuing to refuse Philips' FRAND license offers or a FRAND license determination of this Court. There is a case or controversy of sufficient immediacy, reality and ripeness to warrant the issuance of declaratory judgment.

217. To the extent Quectel does provide a sworn affidavit stating that it would sign a license to Philips' world-wide cellular communications patents at the FRAND rates and terms consistent with ETSI policies as determined by this Court, regardless of any findings on infringement and validity of the Asserted Patents, then an actual controversy will have arisen and exist between Philips and Quectel, which have adverse legal interests, regarding FRAND and ETSI terms for Philips' patents. Philips is entitled to a declaratory judgment determining the appropriate world-wide FRAND licensing terms for Philips' world-wide portfolio of patents under ETSI policies.

218. In addition, with respect to Counts I-VI, Quectel's prior and ongoing infringement of all the Asserted Patents is willful and deliberate, as Quectel became aware of the Asserted Patents, as detailed above, and has continued to infringe.

219. In addition, with respect to Counts I-VI, Quectel's infringement of the Asserted Patents are exceptional and entitles Philips to an award of attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

PRAYER FOR RELIEF

WHEREFORE, Philips requests that this Court enter judgment as follows ordering that:

(a) Quectel infringes the Asserted Patents by making, using, offering for sale, selling and/or offering to sell products covered by the Asserted Patents claims within the United States, and/or by contributing to or inducing such infringement;

(b) Quectel's infringement of the Asserted Patents is willful;

(c) Quectel and its affiliates, subsidiaries, officers, directors, employees, agents, representatives, licensees, successors, assigns, and all those acting for any of them or on their behalf, or acting in concert with them, be preliminarily and permanently enjoined from further infringement of Plaintiff's patent rights;

(d) Plaintiff be awarded compensatory damages and costs, with prejudgment interest;

(e) Plaintiff be awarded treble damages for the willful patent infringement;

(f) This case be declared to be exceptional in favor of Plaintiff under 35 U.S.C. § 285, and that Plaintiff be awarded their costs, attorneys' fees, and other expenses incurred in connection with this action;

(g) A declaration that Quectel, having not committed to accepting an ETSI FRAND license as determined by this Court for a license under Philips' world-wide portfolio of standard essential patents, is either: (a) not entitled to raise any claim seeking a determination of the ETSI FRAND rates and terms or raise any other ETSI FRAND claims or raise any other FRAND claims in this or any other court world-wide, including seeking an anti-suit injunction against these proceedings or instituting any other form of collateral attack to this Court's proper jurisdiction and judgment; or (b) if Quectel does commit to accepting an ETSI FRAND license as determined by this Court, then such license should be determined by this Court and no other

foreign court for a license under Philips' world-wide portfolio of standard essential patents, and

(h) Plaintiff will be awarded such other relief as the Court deems just and proper.

JURY DEMAND

Philips demands a trial by jury on all issues so triable.

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